Mathematics		Don't Fence Me In! This lesson uses spreadsheet software to help students differentiate between area and perimeter and to calculate the area and perimeter of a given rectangle.		5th Grade
Math 5.8, 5.10				C/T 5.2, 5.4
Independent Work Software Application				Understanding

Don't Fence Me In!
Karen K. Campbell
Page County Public Schools

Curriculum Area	Mathematics
Subject Area	Geometry
Grade Level	5th grade
Learning Objectives	• The student will measure to determine the perimeter and area of a given rectangle. • The student will state the formula for perimeter and area. • The student will differentiate between area and perimeter. • The student will identify whether a given problem requires the application of perimeter, area, or both.
Correlation to the SOL	Math 5.8, 5.10 C/T 5.2, 5.4
Video/Technology Hardware/Software Needed	**For class:** Computer Computer Projection System Spreadsheet software (such as *Microsoft Works* or *ClarisWorks*) **Video:** *Math Talk #13: All Shapes and Sizes: Measuring Perimeter and Area*
Materials Required	**For each student:** Ruler with inch units Enough 1" x 1" tagboard squares to cover textbook Pencils Textbooks
Procedures/Activities	1. Hand out the rulers and the squares. 2. Ask students to find the perimeter of their math textbook. Students should already be familiar with the concept of perimeter and should know that they would use the ruler (or tape measure) to accomplish this. 3. Ask students how they could find the area of the cover of their math textbook. Lead students to use the squares (emphasizing **cover**). Students will eventually realize that rather than cover the entire book, they can find the number of squares it takes to cover the length, and the number of squares to cover the width, then multiply. 4. Discuss the units (inches and square inches) that are being used for each different measurement. 5. Show the video *Math Talk #13* (first six minutes, stopping before the "General Mathpital" segment). Pause at key points to question students and check comprehension.

6. Give the student the following problem: "Aunt Susie has just bought you a pony. You have 100 feet of fencing in order to build a pen for the pony. What size pen will give the pony the most area?" Note: the pen must be rectangular.
7. Discuss the use of computer tools to accomplish this task. Students should already equate spreadsheets with calculations. Go to the computer lab or use multiple computers in the classroom, with students grouped together.
8. Work with students to set up a spreadsheet to accomplish this. (Use the presentation device to project the spreadsheet as you work on it.) Be sure to use the correct terminology (column, row, grid, cell, formula, function). The spreadsheet will need columns: Length, Width, Perimeter, Area.
9. Students will input different lengths and widths and enter the formulas for the spreadsheet to calculate perimeter and area. Remind students that the perimeter must equal 100 feet.
10. Give students time to enter a number of different combinations, noting how the amount of area changes with the size of the pen.
11. After students have had time to discover that a square pen gives the most area, come back together as a group and discuss how the area changed while the perimeter remained the same. Discuss other applications of area and perimeter.
12. Discuss the advantage of using the spreadsheet to accomplish the task

Content Assessment	Students will be quizzed on their ability to determine when to calculate area, how to do so, and on the relationship between perimeter and area.
Technology Integration Assessment	Printouts of their spreadsheet with data included will be added to their portfolio.
Extensions	**Math:** Have students measure the length and width of different rooms in their homes and then calculate the perimeter and the area. Discuss uses of such measurements (adding new carpet, calculating lengths of trim) **History/Geography:** Have students learn about how land is measured, now and in the past. Discuss ideas such as a "hundred" or an "acre."